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GB 2201861 A GB 2070392 A EP 0871312 A1
EP 0854535 A1 US 5715311 A

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(54) Abstract Title
Portable telephone with angularly adjustable microphone

(57) A portable telephone formed of an integral casing 10 including a speech reception portion 16A which is provided in proximity to one end portion of the casing 10, and a speech transmission portion 16B provided in proximity to the other end portion of the casing 10. The speech transmission portion 16B includes a movable portion 18 having a unidirectional microphone 20A therein, that portion is disposed at an adjustable angle with respect to the casing 10. Another embodiment of the invention is described as a folding portable telephone (Fig. 11) comprising two casings (50, 52) and rotatable joints (54A, 54B). The rotatable joints (54A, 54B) are positioned between the two casings (50, 52) permitting rotation of one casing relative to the other about a plurality of axes.

FIG. 2

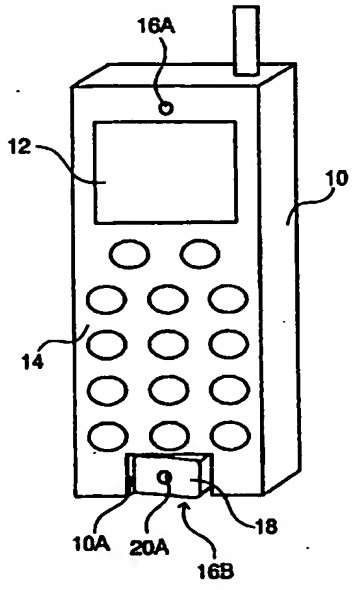

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FIG.1

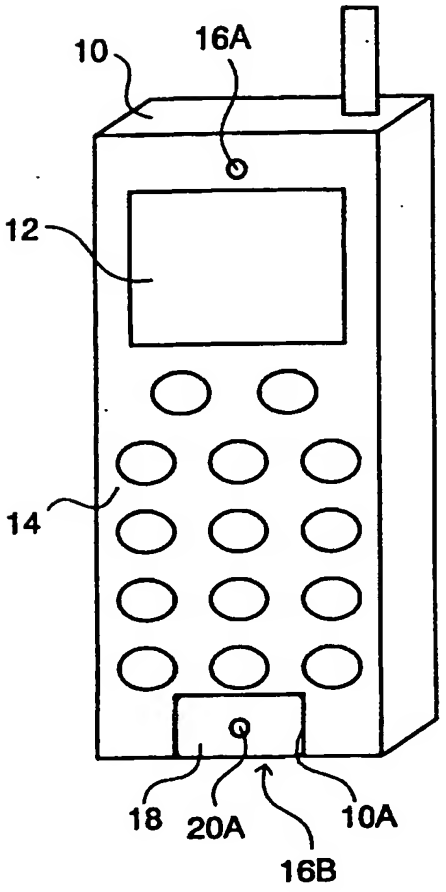


FIG.2

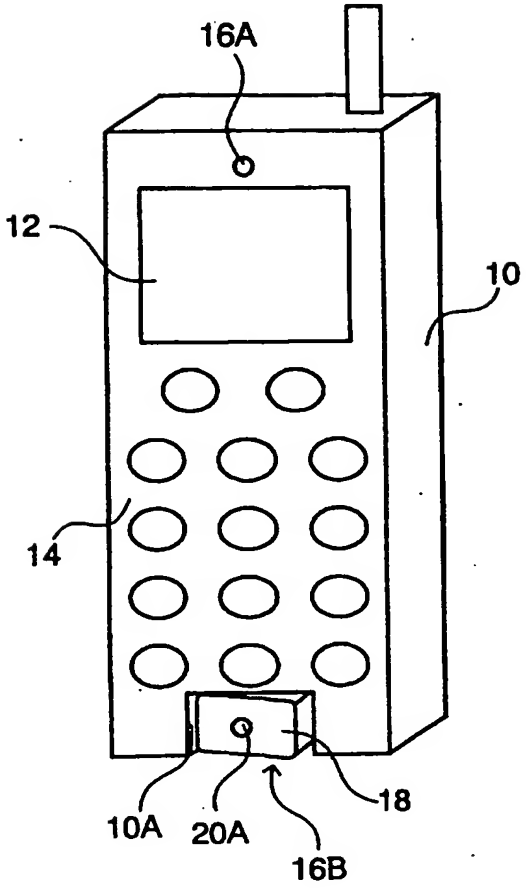


FIG.3

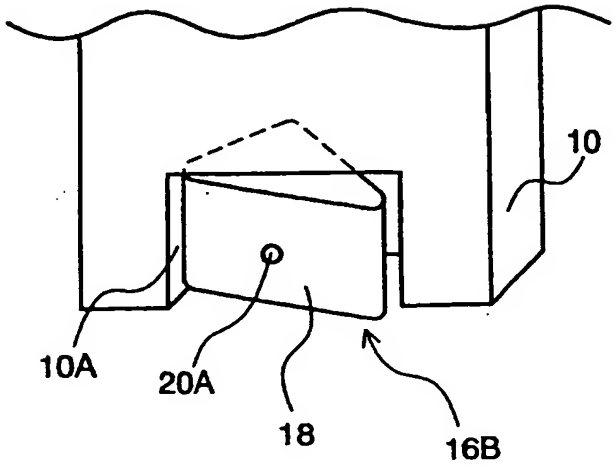


FIG. 4

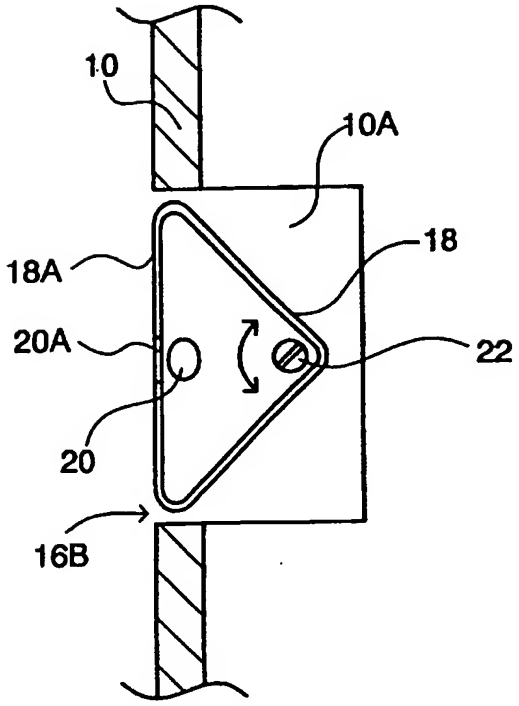


FIG. 5

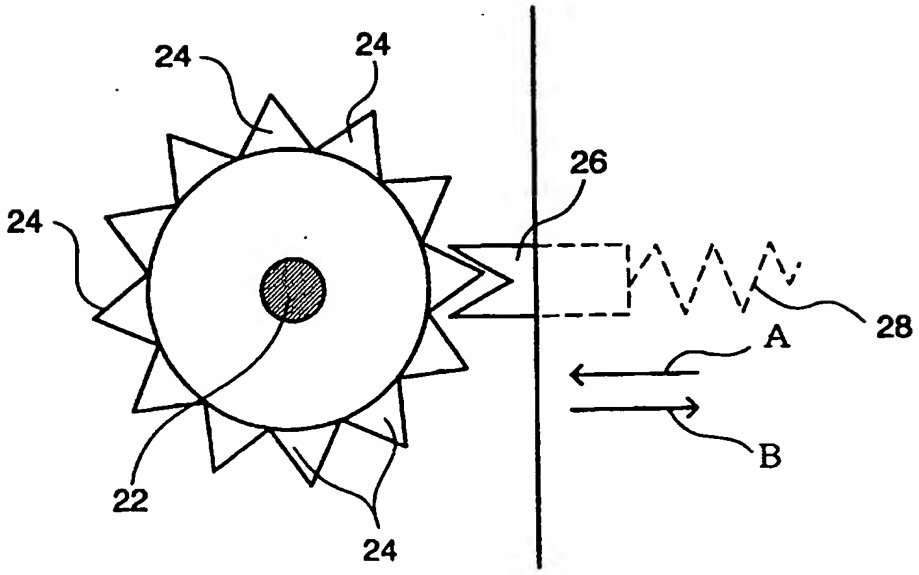


FIG. 6

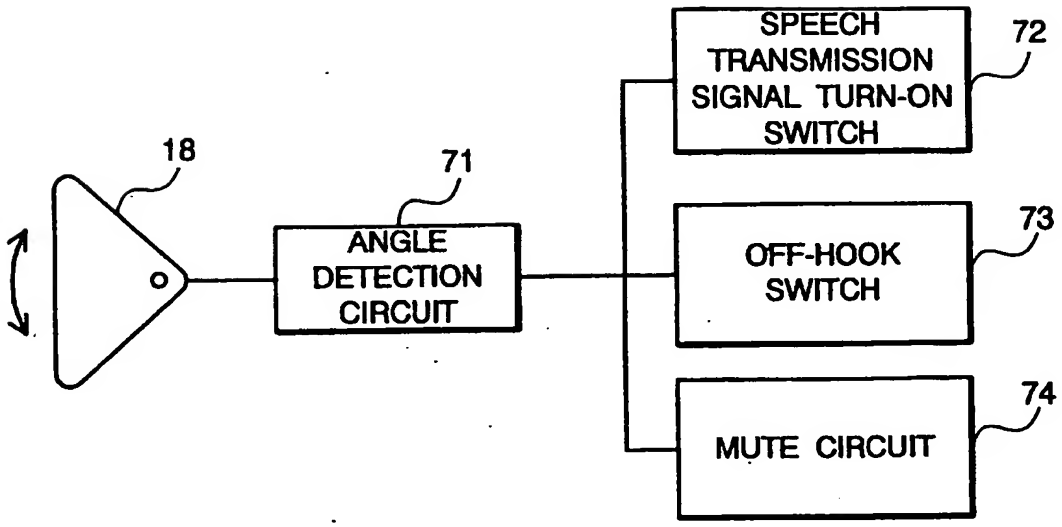


FIG. 7

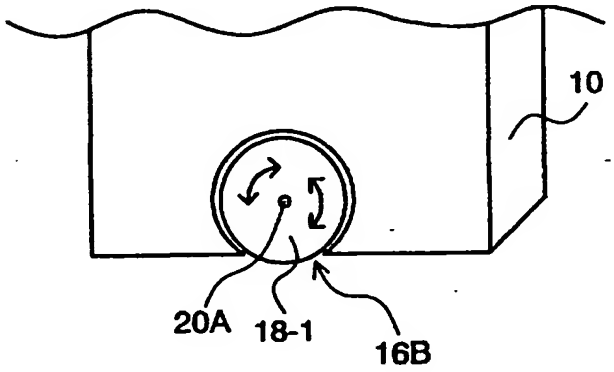


FIG. 8

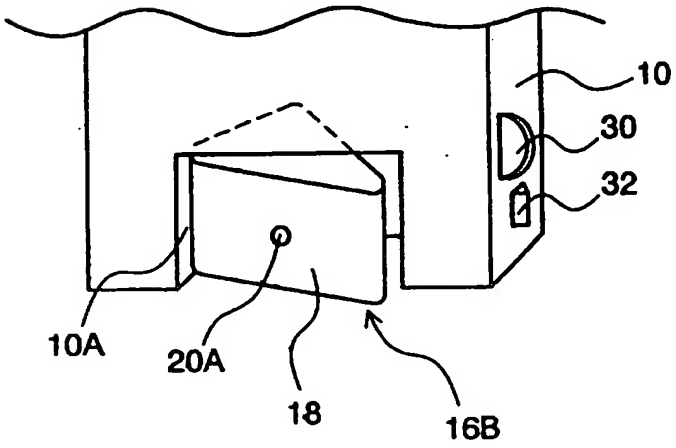


FIG. 9

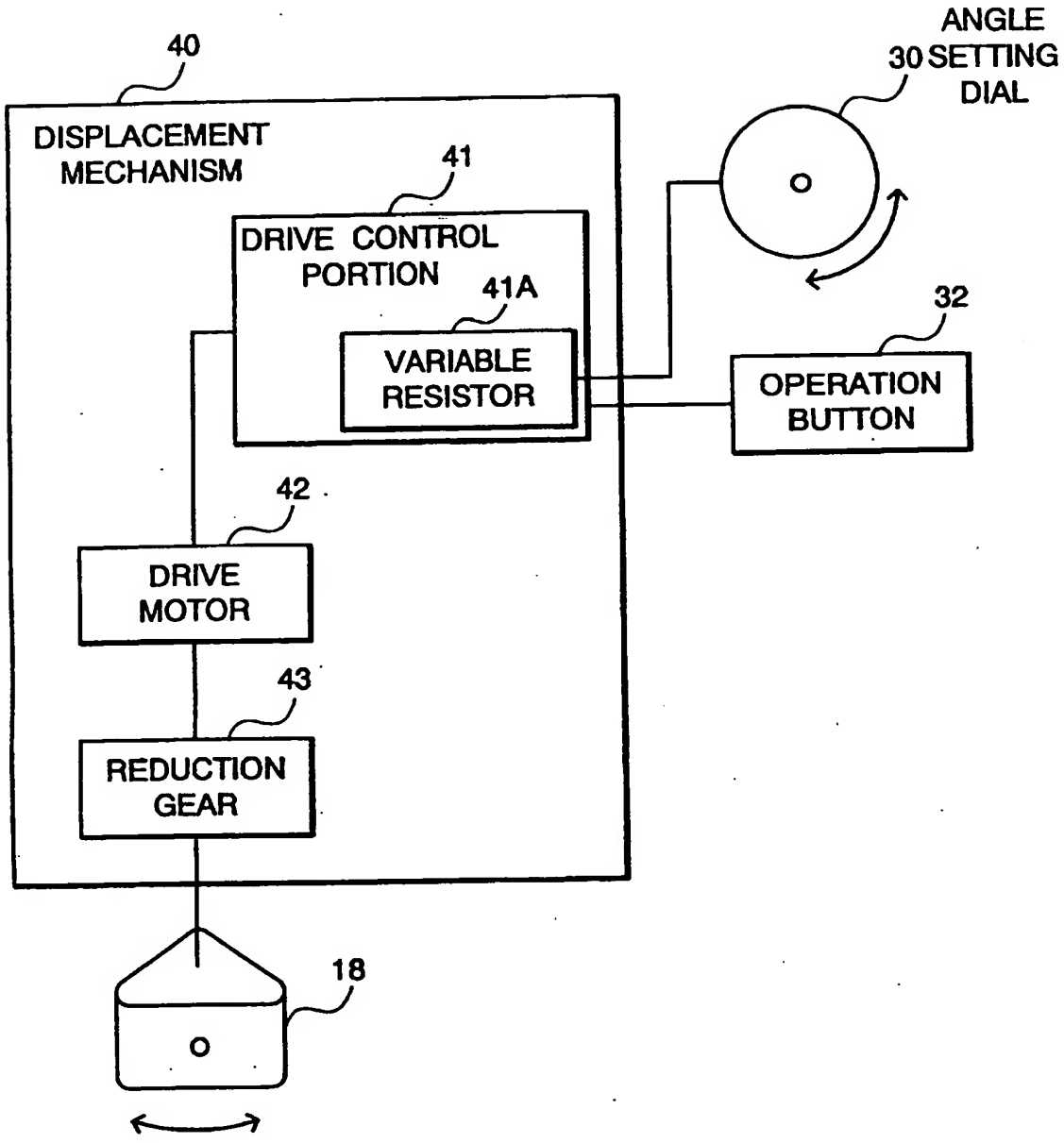

40
DISPLACEMENT MECHANISM
41
DRIVE CONTROL PORTION
41A
VARIABLE RESISTOR
42
DRIVE MOTOR
43
REDUCTION GEAR
18
ANGLE SETTING DIAL
30
32
OPERATION BUTTON

FIG. 10

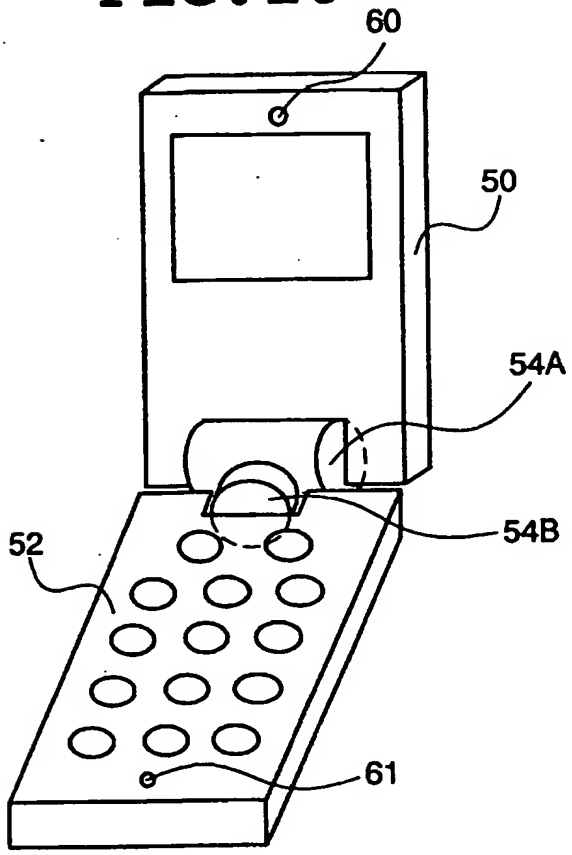


FIG. 11

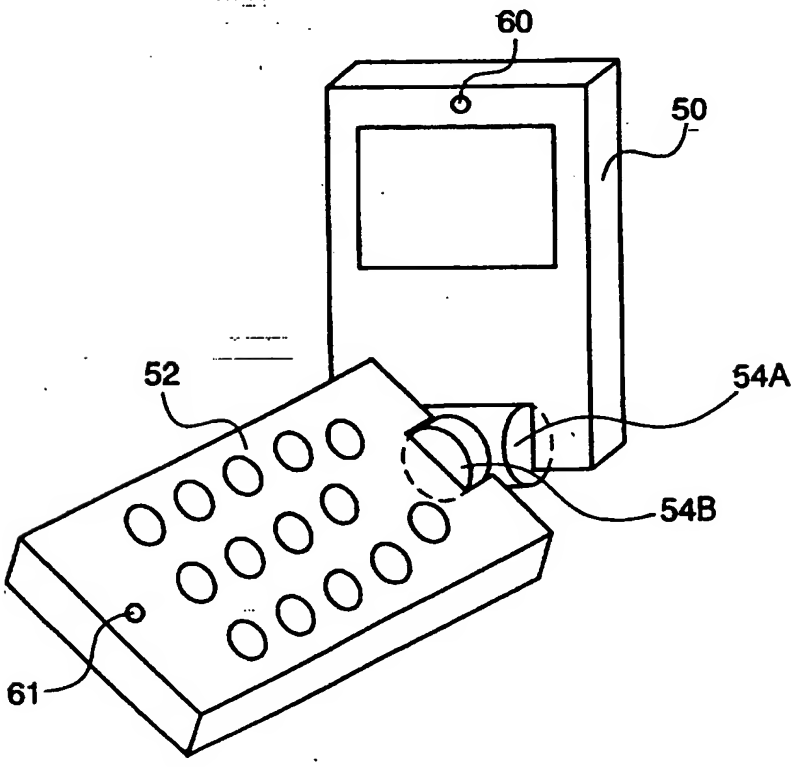
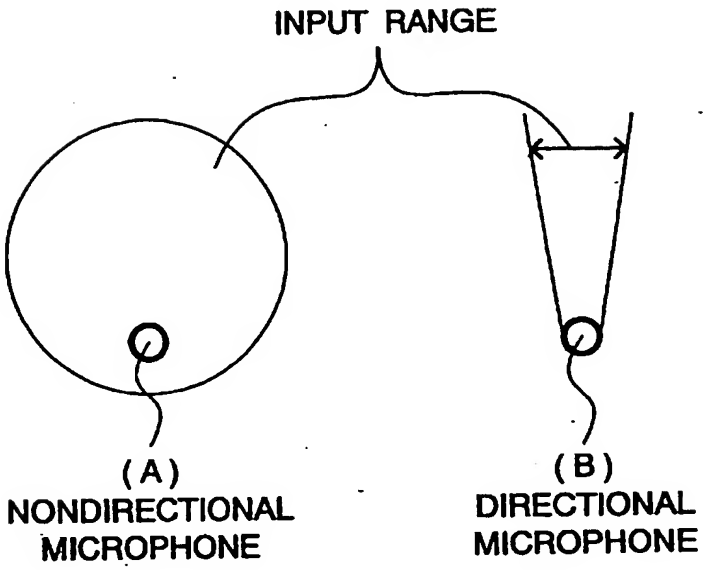


FIG.12


INPUT RANGE
(A)
NONDIRECTIONAL
MICROPHONE
(B)
DIRECTIONAL
MICROPHONE

PORTABLE TELEPHONE

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a portable telephone and, more particularly, to an improvement in a speech transmission portion of a portable telephone.

DESCRIPTION OF THE RELATED ART

Two types of conventional portable telephone structures exist, one having an integral casing, and the other having two casings of the same configuration which are formed foldable with a hinge portion provided therebetween.

In portable telephones having an integral casing structure, a speech reception portion (receiver) and a speech transmission portion (microphone) are provided at the opposite end portions of the casing. On the other hand, portable telephones having two foldable casings commonly have a speech reception portion provided on one of the casings and a speech transmission portion provided on the other.

Because of its small size, a portable telephone having an integral casing may have the drawback that, when a receiver is brought close to the position of an ear, a microphone will be positioned away from a mouth; this lowers voice transmission in some cases.

In addition, because conventional portable telephones employ a nondirectional microphone, unless the microphone is properly positioned near a mouth, surrounding noise will be imput and make it difficult for the other party to the telephone conversation to hear a speaker's voice.

One conventional type of telephone therefore has a casing provided with a drawable member (square poll), with one of a receiver and a microphone provided on the member, and the other provided on the casing; a distance between the receiver and the microphone to the positions of an ear and a mouth is adjustable, as disclosed, for example, in Japanese Patent Laying-Open (Kokai) No. Heisei 6-237288.

According to the above-described conventional technique, however, with a longitudinal drawable member (i.e. square poll) provided on the casing, drawing of the member may make the entire structure fragile. In addition, the drawn member may be caught by clothes, etc., which makes the telephone breakable.

SUMMARY OF THE INVENTION

An object of the preferred embodiments of the present invention is to provide, for a portable telephone having an integral casing, a structure which enables efficient input of a voice to be transmitted even when a speech transmission portion is not allowed to be close to a

mouth, thereby allowing comfortable telephone conversation and involving less breakage, etc.

According to one aspect of the invention, a portable telephone formed of an integral casing comprises:

a speech reception portion provided in proximity to one end portion of the casing, and a speech transmission portion provided in proximity to the other end portion of the casing,

the speech transmission portion including a movable portion having an unidirectional microphone therein which portion is disposed to have an angle adjustable with respect to the casing.

Then, adjusting the angle of the movable portion to face the microphone toward a user's mouth enables efficient input of a voice to be transmitted to allow comfortable telephone conversation even when the microphone and the mouth are separated by a small distance from each other.

In addition, because of a structure in which the angle of a movable portion in block form housed in a housing concavity is adjusted, a portable telephone with a structure involving less breakage, etc. can be provided as compared with one having a longitudinal drawable member.

In the preferred construction, the movable portion is rotatably provided in a concavity formed in the casing, and angular adjustment of the movable portion causes the microphone to face toward a speaker's mouth.

In another preferred construction, without angular adjustment, the movable portion is disposed to have its outer surface substantially flush with an outer surface of the casing so as to cover the housing concavity.

In another preferred construction, the movable portion is formed so as to have a substantially-isosceles-triangular form when viewed in section.

In another preferred construction, the movable portion is formed to be spherical.

In another preferred construction, a brake mechanism is provided which brakes turning of the movable portion at the time of angular adjustment of the movable portion.

In another preferred construction, the brake mechanism includes:

a plurality of engagement claws formed at fixed spacing in the direction of rotation around the axis of rotation of the movable portion;

a stopper provided to move toward and away from any of the plurality of engagement claws provided on the casing side; and,

energizing means for energizing the stopper in the direction of engagement with the engagement claws.

In another preferred construction, the portable telephone further comprises a speech transmission signal turn-on means for detecting an angular adjustment of the

movable portion from an unadjusted position to turn on a transmission line of a speech transmission signal from the microphone.

In another preferred construction, the portable telephone further comprises off-hook means for detecting an angle adjustment of the movable portion from an unadjusted position to connect a radio line to be off-the-hook.

In another preferred construction, the portable telephone further comprises muting means for suppressing the level of a voice to be transmitted when, after an angle adjustment of the movable portion connects an off-the-hook radio line to start telephone communication, the movable portion is returned to its non-adjusted angle.

In another preferred construction, the portable telephone further comprises a displacement mechanism for displacing the movable portion by a set turn angle.

In another preferred construction, an operation portion is provided for activating the displacement mechanism to displace the movable portion.

In another preferred construction, the displacement mechanism includes driving means connected to a rotary shaft of the movable portion to turn the movable portion, and control means for controlling turning of the driving means based on a set value of a set angle.

In another preferred construction, the portable telephone further comprises a displacement mechanism for displacing the movable portion by a set turn angle, a first operation portion for setting a turn angle of the movable portion for the displacement mechanism, and a second operation portion for activating the displacement mechanism to displace the movable portion,

the displacement mechanism including driving means connected to a rotary shaft of the movable portion to turn the movable portion, and control means having setting means whose turn angle is set by the first operation means to control a turn of the driving means based on a set value of the setting means.

According to another aspect of the invention, a portable telephone has a folding casing, wherein

two casings are disposed to open and close with a hinge portion provided therebetween,

a speech reception portion is provided on one casing and a speech transmission portion is provided on the other casing, and

the one casing is turnably pivoted on the hinge portion by means of a rotary shaft which rotates in a backward direction around an axis orthogonal to a rotation axis of the hinge portion.

Other objects, features and advantages of the present invention will become clear from the detailed

description given herebelow.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred features of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view showing the appearance of a portable telephone according to a first embodiment of the present invention, showing a state where a speech transmission portion is not angularly adjusted;

Fig. 2 is a perspective view showing the appearance of a portable telephone according to a first embodiment of the present invention, showing a state where a speech transmission portion is angularly adjusted

Fig. 3 is a partial expanded perspective view of the movable portion and its surrounding portion of the portable telephone shown in Fig. 1;

Fig.4 is a partial cross-sectional expanded plan view of the movable portion and its surrounding portion of the portable telephone shown in Fig. 1;

Fig. 5 is a plan view showing a specific example of a brake mechanism in the portable telephone illustrated in Fig. 1;

Fig. 6 is a block diagram showing a structure for turning-on a speech transmission signal and for conducting off-hook linking with the movable portion;

Fig. 7 is a view showing another example of a speech transmission portion (movable portion);

Fig. 8 is a partial expanded perspective view showing a movable portion and its surrounding portion of a portable telephone according to a second embodiment of the present invention;

Fig. 9 is a block diagram showing an example of a structure of a displacement mechanism of the second embodiment;

Fig. 10 is a perspective view showing an example of an application of the present invention to a folding portable telephone;

Fig. 11 is a perspective view showing a state of a casing turned to the backward direction in the application example of Fig. 10; and,

Fig. 12 is an explanatory diagram showing a range of input of a directional microphone and a nondirectional microphone.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiments of the present invention will be discussed hereinafter in detail with reference to the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will

be obvious, however, to those skilled in the art that the present invention may be practised without these specific details. In other instances, well known structures are not shown in detail in order to unnecessarily obscure the present invention.

In the following embodiments of a portable telephone according to the present invention will be described in detail with reference to the drawings.

The portable telephone according to the present embodiment having an integral casing is structured to use a directional microphone as a microphone of a speech transmission portion, and has a movable portion in block form with a microphone mounted thereon provided on the casing so as to be angularly adjustable. This enables efficient input of a voice to be transmitted so as to realize comfortable telephone conversation by angular adjustment of the movable portion to face the microphone toward a user's mouth even when the microphone and the mouth are separated by a small distance.

Figs. 1 and 2 are perspective views showing the appearance of a portable telephone according to the first embodiment of the present invention; Fig. 1 shows a state where a movable portion with a microphone for speech

transmission has its angle unadjusted, and Fig. 2 shows a state where the movable portion with the speech transmission microphone has its angle adjusted.

Fig. 3 is a partial perspective view showing the movable portion and its surrounding portion expanded in the present portable telephone, while Fig. 4 is a partial cross-sectional plan view showing the movable portion and its surrounding portion expanded in the present portable telephone.

As illustrated in Figs. 1 and 2, the portable telephone of the present embodiment has an integral casing 10; on the front side portion of the casing 10, an LCD display portion 12 and a key entry portion 14 are provided.

In addition, the telephone has a speech reception portion 16A having a built-in speaker which is disposed in the proximity of the upper edge portion of the casing 10, and has a speech transmission portion 16B formed as a movable portion 18 having a built-in microphone 20 which is disposed in the proximity of the lower edge portion of the casing 10.

The speech transmission portion 16B includes an open housing concavity portion 10A provided at the front side of the casing 10 in which the movable portion 18 is housed and arranged.

As illustrated in Fig. 4, the movable portion 18 is formed to be substantially an isosceles triangle

whose sectional configuration is round. Without angular adjustment, an outer surface 18A of the movable portion 18 is arranged to be substantially flush with the outer surface of the casing 10 so as to cover the opening of the housing concavity portion (space) 10A.

Then, on the outer surface 18A of the movable portion 18, a sound-collecting hole 20A of the built-in microphone 20 is provided. In the present embodiment, a microphone 20 is used that has unidirectivity which is arranged to have directivity in the vertical direction with respect to the outer surface 18A of the movable portion 18.

The movable portion 18 is rotatably disposed in the housing concavity portion 10A on a rotary shaft 22 provided vertically in the housing concavity portion 10A of the casing 10. By the operation of turning the movable portion 18 to adjust its angle (direction), the outer surface 18A on which the sound-collecting hole 20A of the microphone 20 is disposed can be kept facing a speaker's mouth.

The rotary shaft 22 of the movable portion 18 is provided with a brake mechanism for braking a rotational displacement of the movable portion 18 to maintain it at a desired angle.

Fig. 5 is a plan view showing a specific example of this brake mechanism.

The brake mechanism is structured to have, in the movable portion 18, a plurality of engagement claws 24 formed at fixed spacing (e.g. at the spacing of 15 degrees) in the direction of rotation around the axis of the rotational center of the movable portion 18; within the casing 10, a forked stopper 26 to be engaged with (fitted into) any of the plurality of engagement claws 24, and a compression coil spring 28 energizes the stopper claw 26 toward the engagement claw 24 (in the direction of the arrow A in Fig. 5). The stopper 26 is movably disposed in the directions of the arrows A and B in the figure.

In this brake mechanism, by the operation of turning the movable portion 18 by a user's (speaker's) finger, the stopper 26 is pushed by the engagement claws 24 to withdraw against the spring force of the compression coil spring 28, whereby the movable portion 18 is allowed to turn.

When the operation of turning the movable portion 18 is stopped, the stopper claw 26 advances by the spring force of the compression coil spring 28 to engage with the engagement claw 24, thereby naturally regulating turning of the movable portion 18.

In such a brake mechanism as mentioned above, engagement claws 24 may be disposed at smaller spacing,

and braking may be achieved not by engagement of claws but by friction.

Also in the present embodiment, the movable portion 18 has a function as a switch for turning on a transmission line of a speech transmission signal and executing off-hook.

Structure of the above function is shown in Fig. 6. When the movable portion 18 changes its direction in the turning operation, the angle detection circuit 71 detects the changed state; then a speech transmission signal turn-on switch 72 turns on/off a transmission line of a speech transmission signal and an off-hook switch 73 conducts off-hook.

By these switches, various circuit operations are executed according to a state of the movable portion 18.

First, the angle detection circuit 71 detects a change from a state where the movable portion 18 is not angularly adjusted (initial state: the state where the outer surface 18A of the movable portion 18 is substantially flush with the outer surface of the casing 10) to a state where the same has its angle adjusted, with the speech transmission signal turn-on switch 72 automatically turning on the transmission line of a speech transmission signal from the microphone 20 (speech transmission signal turn-on function).

Also, the angle detection circuit 71 detects an angular adjustment of the movable portion 18

whose angle has not been adjusted, and the off-hook switch 73 connects the radio line to be off-the-hook (off-hook function).

More specifically, at the arrival of a call, when a user recognizes the call arrival by a rumble of a ring tone or the like, angular adjustment alone of the movable portion 18 turns on the line of the speech transmission signal. The arrival call can be responded to off-the-hook, whereby the line is connected to the other party's telephone to enable communication.

At the time of making a call, angular adjustment alone of the movable portion 18 turns on the line of the speech transmission signal, as well as attaining a state where a call can be made off-the-hook to the radio line, at which stage dial entry, etc. enables call-up of the other party's telephone.

In other words, the operation of turning the movable portion 18 constitutes a preparation operation for conducting a telephone conversation at the reception of a call, and a preparation operation for dialling at the time of making a call, resulting in saving other key operations.

When responding to an arriving call without adjustment of the angle of the movable portion 18 or when conducting operation of making a call, a

transmission line of a speech transmission signal is turned on and off-hook is conducted by their corresponding key operations which are the same as those of conventional operation.

In addition, as shown in Fig. 6, the present embodiment is provided with a mute circuit 74 (muting function) for suppressing the level of a voice to be transmitted when after entering the state of conducting a telephone conversation by the turning operation of the movable portion 18, the angle detection circuit 71 detects the movable portion 18 returning to the state where its angle is not adjusted as described above.

This muting function produces an effect of preventing transmission of noise to a another party of the telephone conversation when the communication is interrupted.

Also, by making the movable portion 18 again have an adjusted angle, the muting function is released to return a voice to be transmitted to an ordinary level. For ending the call, call ending processing is executed by entering any of operation keys after returning the movable portion 18 to the state where its angle is not adjusted.

Since the above-described portable telephone of the present embodiment allows the directional microphone 20 to be disposed at an arbitrary angle by the adjustment of the angle of the movable portion 18,

directing the microphone 20 toward a speaker's mouth during telephone conversation enables effective collection of voices to be transmitted to realize comfortable telephone communication.

Also, the use of a directional microphone enables input of surrounding voices and noise to be suppressed.

Fig. 12 is an explanatory diagram showing a range of input of a directional microphone and a nondirectional microphone. As shown in Fig. 12(A), with a nondirectional microphone, because of its wide input range, surrounding noise etc. other than a voice of a speaker is input, while with a directional microphone, as illustrated in Fig. 12(B), because of its narrow input range, directing the microphone toward the speaker's mouth enables appropriate input of only a voice to be transmitted.

Structuring the portable phone to execute off-hook and turn-on the microphone 20, and further, a muting operation by moving the microphone 20 (i.e. movable portion 18) saves key operations for their processing, thereby improving operability.

In addition, since the movable portion 18 provided with the microphone 20 is hardly drawn from the casing 10, damage, for example, caused by the movable portion 18 caught by clothes, will not be done, resulting in a portable telephone excellent in

durability.

Although the foregoing example has been described with respect to the structure in which the movable portion 18 is displaced by a turn in the two-dimensional direction (horizontal direction), for example, a spherical movable portion 18-1 having the built-in microphone 20 may be attached to the casing 10 by a spherical bearing to realize angle adjustment by a three-dimensional (solid direction) turn as illustrated in Fig. 7.

Next, Fig. 8 is a partial perspective view showing a movable portion and its surrounding portion expanded in a portable telephone according to a second embodiment of the present invention. Components common to those in the example shown in Figs. 1 to 5 are given the same reference numerals to omit repetition of their description.

While in the above-described first embodiment, the movable portion 18 has its angle adjusted by manual operation, in the second embodiment, a pop-up function is provided which allows the movable portion 18 to be displaced to have a desired angle by one-touch operation.

In Fig. 8, a casing 10 of the portable telephone includes an angle setting dial 30 for setting the angle of the movable portion 18, a displacement mechanism 40 for automatically conducting rotational displacement of the movable portion 18 according to the angle set by the angle setting rotary lug 30 and an operation button 32

for activating the displacement mechanism according to user's pressing operation.

Example of a structure of the above-described displacement mechanism 40 is shown in Fig. 9. In Fig. 9, the displacement mechanism 40 is composed of a drive control portion 41, a drive motor 42, and a reduction gear 43.

The drive control portion 41 is for controlling automatic turning of the movable portion 18 by the drive motor 42, and changing a value of its variable resistor 41A by the operation of the angle setting dial 30 leads to setting of the angle of the movable portion 18 which turns at the press of the operation button 32.

Every time the operation button 32 is pressed, the drive control portion 41 controls the drive motor 42 such that the movable portion 18 turns by a set angle.

The drive motor 42 is connected to a rotary shaft 22 of the movable portion 18 through the reduction gear 43.

As described above, when the variable resistor 41A is operated by the angle setting dial 30, the displacement mechanism 40 reads a resistance value of the variable resistor 41A by means of the drive control portion 41 and controls the drive motor 42 and the reduction gear mechanism 43 which drive turning of the movable portion 18 according to the value. The displacement mechanism 40 displaces the movable portion

18 by instantaneous operation.

For example, when the operation button 32 is pressed once, the displacement mechanism 40 starts operating to displace the movable portion 18 by a set angle (that angle being adjustable). When the operation button 32 is again pressed, the displacement mechanism 40 starts operating to displace the movable portion 18 from the state where the angle is being adjusted to the state where the same is not being adjusted.

Such a structure as described in the second embodiment enables a portable telephone with more excellent operability to be provided. Structure of the displacement mechanism 40 is not limited to an electrical mechanism using the drive motor 42 but may be a mechanical one in which, for example, the movable portion 18 is angularly displaced by using a torque of a return coil spring, and is returned to the original position by manual operation.

Figs. 10 and 11 are perspective views showing an example of an application of the present invention to a folding portable telephone.

In the present portable telephone, two casings 50 and 52 of the same configuration are disposed to open and close with a hinge portion 54A provided therebetween, with a speech reception portion 60 provided on one casing 50 and a speech transmission portion 61 on the other casing 52. Here, the hinge portion 54A is an axis

which allows the casings 50 and 52 to turn so as to open and close on each other.

In addition, the other casing 52 is pivoted on the hinge portion 54A by means of a rotary shaft 54B which rotates in a backward direction around an axis orthogonal to a rotation axis of the hinge portion 54A.

With this arrangement, turning the other casing 52 to the backward direction enables the speech transmission portion 61 (microphone) provided on this casing 52 to face toward a speaker's mouth for conducting telephone conversation.

Also with this portable telephone, at the stage of opening the casing 52, processing such as off-hook is executed. The same structure can be applied to a portable telephone called a flip phone in which only a microphone portion is opened.

As described in the foregoing, according to the portable telephone of the present invention, angular adjustment of a speech transmission portion is enabled in a portable telephone having an integral casing so as to realize telephone conversation with a microphone facing toward a speaker's mouth.

It is therefore possible to provide a portable telephone having an integral casing with a structure which enables efficient input of a voice to be transmitted even when a speech transmission portion is not close to a mouth, thereby enabling comfortable telephone communication and

involving less breakage, etc.

Although the invention has been illustrated and described with respect to exemplary embodiments thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omissions and additions may be made therein and thereto, without departing from the scope of the present invention. Therefore, the present invention should not be understood as limited to the specific embodiments set out above but to include all possible embodiments within a scope encompassed and equivalents thereof with respect to the features set out in the appended claims.

Each feature disclosed in this specification (which term includes the claims) and/or shown in the drawings may be incorporated in the invention independently of other disclosed and/or illustrated features.

The text of the abstract filed herewith is repeated here as part of the specification.

A portable telephone formed of an integral casing including a speech reception portion is provided in proximity to one end portion of the casing, and a speech transmission portion is provided in proximity to the other end portion of the casing. The speech transmission portion includes a movable portion having a directional microphone therein; that portion is disposed at an adjustable angle with respect to the casing.

CLAIMS:

1. A portable telephone formed of an integral casing, comprising:

a speech reception portion provided in proximity to one end portion of said casing, and a speech transmission portion provided in proximity to the other end portion of said casing,

said speech transmission portion including a movable portion having a directional microphone therein, which portion is disposed to be angularly adjustable with respect to said casing.

2. The portable telephone as set forth in claim 1, wherein:

said movable portion is provided turnably in a concavity formed in said casing, and

angular adjustment or said movable portion causes said microphone to face toward a speaker's mouth.

3. The portable telephone as set forth in claim 1, wherein:

with no angular adjustment, said movable portion is disposed to have its outer surface substantially flush with an outer surface of said casing so as to cover said housing concavity.

4. The portable telephone as set forth in claim 1, wherein:

said movable portion is formed to be substantially isosceles triangle in sectional view.

5. The portable telephone as set forth in claim 1, wherein:

said movable portion is formed to be spherical.

6. The portable telephone as set forth in claim 1, wherein:

a brake mechanism is provided which brakes turning of said movable portion at the time of angular adjustment of said movable portion.

7. The portable telephone as set forth in claim 6, wherein:

said brake mechanism includes:

a plurality of engagement structures formed at fixed spacing in the direction of rotation around the rotational axis of said movable portion;

a complementary engagement structure provided to move toward and away from any of said plurality of engagement structures provided on said casing side; and,

energizing means for energizing said complementary engagement structure to move in the direction of engagement with said engagement structures.

8. The portable telephone as set forth in claim 1, further comprising:

a speech transmission signal turn-on means for detecting an angular adjustment of said movable portion from an unadjusted position to turn on a transmission line of a speech transmission signal from said microphone.

9. The portable telephone as set forth in claim 1, further comprising:

off-hook means for detecting an angular adjustment of said movable portion from an unadjusted position to connect a radio line off-the-hook.

10. The portable telephone as set forth in claim 1, further comprising:

muting means for suppressing the level of a voice to be transmitted when, after an angular adjustment of said movable portion causes a radio line to be connected off-the-hook to start telephone communication, said movable portion is returned to its original angular position.

11. The portable telephone as set forth in claim 1 further comprising:

a displacement mechanism for displacing said movable portion by a set turn angle.

12. The portable telephone as set forth in claim 11, wherein:

an operation portion is provided for activating said displacement mechanism to displace said movable

portion.

13. The portable telephone as set forth in claim 11, wherein:

said displacement mechanism includes:

driving means connected to rotary shaft of said movable portion to turn said movable portion; and,

control means for controlling turning of said driving means based on a set value of a set angle.

14. The portable telephone as set forth in claim 1, further comprising:

a displacement mechanism for displacing said movable portion by a set turn angle,

a first operation portion for setting a turn angle of said movable portion for said displacement mechanism; and,

a second operation portion for activating said displacement mechanism to displace said movable portion;

said displacement mechanism including driving means connected to a rotary shaft of said movable portion to turn said movable portion, and control means having setting means whose turn angle is set by said first operation means to control a turning of said driving means based on a set value of said setting means.

15. A portable telephone having a folding casing, wherein:

two casings are disposed to open and close with a rotatable joint provided therebetween,

a speech reception portion is provided on one casing and a speech transmission portion is provided on the other casing, the rotatable joint permitting rotation of the one casing relative to the other about a plurality of axes.

16. The portable telephone as set forth in claim 15, wherein the rotatable joint comprises hinge means permitting said rotation about two orthogonal axes.

17. A portable telephone substantially as herein described with reference to and as shown in the accompanying drawings.

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Application No: GB 0006394.1 27 **Examiner:** Carol Ann McQueen
Claims searched: 1-17 **Date of search:** 25 May 2000

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Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): H4J (JK)

Int Cl (Ed.7): H04B 1/38, H04M 1/02, 1/03, 1/19, H04R 1/08

Other: ONLINE: EPODOC, JAPIO, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2201861 A	(STC) whole document and figures.	1 & 9
X	GB 2070392 A	(STANDARD TELEPHONES) whole document and figures	1 & 9
X	EP 0871312 A1	(PAN) whole document and fig. 1	1
X	EP 0854535 A2	(SONY) abstract and figure 1.	1
X	US 5715311	(SONY) abstract and figures 1 & 2	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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